Figure 9 shows a schema of the electrodes for DEP;

Figures 10a-16 are schematic views of the steps for nanocontact realization;

Figure 11 shows conclusive steps of the process for the realization of a nanowire;

Figure 12 shows schematically a configuration scheme of a SET microcavity to implement the dielectrophoresis chamber;

Figure 13 shows a final structure obtained with the configuration scheme of Figure 12;

Figures 14-18 depict a scheme of a process to build up the SET microcavity.

DETAILED DESCRIPTION OF THE INVENTION

The idea is to realize a SET device working at room temperature, employing a lithographically patterned substrate over which nanoclusters are forced to assemble under the control of a non-homogeneous electric field. The controlled migration and the desired location of the metallic passivated nanoclusters are based on the a dielectrophoretic process, which is well-known by itself but has never been applied in this field.

FIRST EXAMPLE

1. Realization of a patterned substrate

On a semiconductor substrate 10, for instance a silicon substrate with a silicon oxide layer 12 formed thereon, a rectangular central aperture 14, paths 16 for metallic contacts, and peripheral apertures 18 are opened, leaving a thickness of the oxide layer 12 over the Si substrate 10.

More particularly, the depth of the aperture can be about three times its width. A high conductive metallic layer 20, for instance a gold layer, is deposited on the contact paths 16 and in the peripheral apertures 18 to form contact pads 22 without invading the central aperture 14.